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Summary.—The paper gives some new quantitative experiments proving that the 'instinctive' motions of animals to light are phenomena of automatic orientation (heliotropism) and a function of the constant intensity of light; the exact expression of the function being the Bunsen-Roscoe law of photochemical action.

¹ Loeb, J., *Sitzber. Würzburger physik-med. Ges.*, 1888; *Der Heliotropismus der Tiere und seine Übereinstimmung mit dem Heliotropismus der Pflanzen*. Würzburg, 1890. *Studies in General Physiology*, 1, 1906.

² Loeb, J., *Arch. ges. Physiol., Bonn*, 56, 1897, (439); *J. Exp. Zool., Wistar Inst., Philadelphia*, 4, 1907, (151); *The Mechanistic Conception of Life*, Chicago, 1912, pp. 27, 41.

³ Loeb, J., and Ewald, W. F., *Zentrabl. Physiol., Wien.*, 17, 1914, (1165).

⁴ Loeb, J., and Wasteneys, H., J., *Exp. Zool., Wistar Inst., Philadelphia*, 22, 1917, (187).

⁵ Ewald, W. F., *Science, New York*, 38, 1913, (236).

⁶ Patten, B. M., *J. Exp. Zool., Wistar Inst., Philadelphia*, 17, 1914, (213); *Amer. J. Physiol.*, 38, 1915, (313).

⁷ Patten, B. M., *J. Exp. Zool., Wistar Inst., Philadelphia*, 17, 1914, (270).

⁸ Groom, T. T., and Loeb, J., *Biol. Centrbl.*, 10, 1890, (161).

⁹ Parker, G. H., and Patten, B. M., *Amer. J. Physiol.*, 31, 1912-13, (22); Abney, W. de W., *Report 59th Meeting, British Assoc. Adv. Sc.*, 1899, (481); *Treatise on photography*, 10th ed. London, 1907; Englisch, E., *Arch. wiss. Phot., Halle*, 1, 1899, (117).

THE APPEARANCE OF REVERSE MUTATIONS IN THE BAR-EYED RACE OF *DROSOPHILA* UNDER EXPERIMENTAL CONTROL

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Communicated by T. H. Morgan, July 10, 1917

During some experiments in selection for higher and lower facet numbers in the bar-eyed race of *Drosophila ampelophila* I obtained six full-eyed males and five heterozygous females from the stock bottles and the selected lines.

In appearance these flies could not be distinguished from normal full-eyed males and heterozygous females. Three males and three females were mated with bar-eyed flies and gave the offspring anticipated from such normal flies. In two cases the males gave only bar-eyed male offspring and heterozygous female offspring. In the third case the offspring were not examined until twenty-four days after the mating had been made and as the result of the hatching of individuals from the second generation bar-eyed females and full-eyed males were also present. The offspring of the heterozygous females in each case consisted of bar-eyed and full-eyed males and bar-eyed and heterozygous females. Some of the offspring of a full-eyed male were interbred and produced full-eyed males and bar-eyed females as well as bar-eyed males

and heterozygous females. In appearance and behavior, therefore these flies could not be distinguished from normal full-eyed males and heterozygous females.

The possibility that the flies were due to contamination is not absolutely excluded, but the probability is very low. In handling food and flies the usual precautions were used. No larvae or flies appeared in the food jars. Both vestigial-winged and long-winged races were handled, but no contamination of one with the other appeared. Three full-eyed males and one heterozygous female appeared in the vestigial race and all had vestigial wings; the others appeared in the long-winged race, and all had long wings. The fact that all females were heterozygous is a very strong argument against the probability of contamination. In case of contamination the females should, at least in the majority of cases, have been full-eyed; but no full-eyed females appeared. In the face of this evidence it is almost necessary to conclude that these flies appeared by reverse mutation and not by contamination.

The appearance of such reverse mutations can not readily be explained on the basis of the presence and absence theory nor on the theory of association and disjunction, but it is not difficult to explain on the theory of chemical change. If a chemical change in the constitution of some substance, probably in the chromosomes, produced the bar-eyed mutant, then a reversion of that chemical change would produce the original substance and so bring about the reappearance of the original character, the full eye.

The data upon which this report is based together with a more detailed discussion will be published in the near future in the report on the selection experiments.

THE PART PLAYED BY ALCYONARIA IN THE FORMATION OF SOME PACIFIC CORAL REEFS

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Following up my studies on the coral reefs of the Tortugas Islands, in which it was found that in this particular region the alcyonaria contribute more limestone to the reefs in a given time than do the stony corals, a similar study of the coral reefs was undertaken, under the auspices of the Carnegie Institution of Washington, at the Island of Tutuila, American Samoa.